Citizen Science Projects (MOOC) 4.4

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Script	Visuals
[Music]	FutureLearn opening animation
[Music]	WeObserve logo | University of Dundee logo
DAHLIA DOMAIN: Data sharing is a very important part of citizen observatories, and as the number of citizen-generated data is constantly increasing, it also becomes more and more important to ensure that the data is easily findable, accessible, comparable, and reusable in the future. In LandSense, we use the LandSense engagement platform for openly sharing data, and we use a distributed system to do so. The data from the different citizen science campaigns are hosted with the various project organisations but are accessible on the platform. This also helps ensure that access to the data can be sustained beyond the lifetime of the project. LandSense strives towards the FAIR data principles, which we mentioned initially. FAIR stands for findable, accessible, interoperable, and reusable data.	
The FAIR principle can also help trigger new citizen science activities. For example, if you visit the LandSense website, you can contribute to ongoing campaigns and visualise data from past campaigns on an easy-to-use map. You can analyse the data or directly use it in your own citizen science initiatives. When it comes to data sharing, a very important topic for citizen science, and the key challenge, is compliance with the new EU legislation on data protection and privacy of individuals, the so-called GDPR-- the General Data Protection Regulation-- of the EU. LandSense ensures that the collection of personal data is kept to a minimum, and that all shared data is anonymized and compliant with EU regulations.	

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Sharing data is also about creating a two-way connection between platforms, like the GEOSS Common Infrastructure, the Copernicus Services, that inspire initiative for efficient sharing of spatial data, other open data portals, and the citizen observatories. Groundtruth 2.0 considers ways of standardising citizen science data to make it available and equal to other common data sets. Common standards approved by the open geospatial consortium are the SOS-- the sensor observation service-- for data sharing, and the observations and measurements for data collection. This approach is also known as sensor web enablement. Groundtruth 2.0 has worked on the citizen observations profile for this approach and has designed modules to convert data from the different project observatories.	
With this approach, it is now possible to connect Groundtruth 2.0 data with data from other initiatives, such as the hackAIR project. The GROW observatory has shared its results in many ways to connect with different audiences and stakeholders, including citizen scientists, academics, policymakers, and the general public. GROW has run several online courses on environmental monitoring, soil, food growing, and satellite science. They were a great platform to share data and for participants to learn how to analyse them and how to gain meaningful insights. The GROW website provides access to different kinds of visualisations, such as interactive maps and graphs. Citizen scientists who have contributed data to GROW can query and format their own data.	
They can download them and build on shared data sets that allow geospatial data analysis for communities. A GROW place in Portugal has used GitHub to share and provide their analysis on soil moisture for crop growing using Python Jupyter notebooks. Programmes with	

appropriate access keys can retrieve all sensor and time series data in JSON or XML format. Scientists can select data geographically, temporally, and by data type. Data can also be provided in the OGC SOS format. These data can be discovered through the GEOSS portal, where earth observation data from all over the world can be searched.	
The Scent Observatory has developed a harmonisation platform to manage, store, and provide access to all citizen-generated data. It also translates them to standardised resources following the OGC standards. Scent has used the SensorThings API to connect and expose citizen-generated and in situ measurements. This facilitates the integration of these measurements into new models and applications. The platform also provides a visualisation site, so that anyone can explore the different resources. Users can access interactive dashboards with several philtre options, statistics, and spatial visualisations. Scent has also registered as a GEOSS data provider, placing its standardised resources in the service of the global earth observation community.	
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